OCTOBER 1961 — 36 NO. SM 5
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Your attention is invited

NEWS OF THE SOIL MECHANICS AND FOUNDATIONS DIVISION OF ASCE

JOURNAL OF THE SOIL MECHANICS AND FOUNDATIONS DIVISION
PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

DIVISION ACTIVITIES

SOIL MECHANICS AND FOUNDATIONS DIVISION

Proceedings of the American Society of Civil Engineers

NEWS

October, 1961

ENGINEERING GEOLOGY MEETING IN CINCINNATI

Mr. George A. Kiersch, Chairman of the Division on Engineering Geology, Geology Society of America has extended an invitation to the members of our Division to attend a meeting to be held in Cincinnati, Ohio on November 1, 2, 1961. This invitation has been extended because there is a sizable group making up common membership in both the American Society of Civil Engineers and the Geological Society of America.

The Engineering Geology technical session will be held on Thursday, November 2, 1961; a field trip to points of interest to engineering geologists and foundation engineers will be held on Wednesday, November 1st. Program Chairman for the technical sessions is Professor Robert W. Karpinski of the University of Illinois, Chicago. Two separate symposia will be held as follows:

Engineering Geology in Limestone Terrain (morning)

"False fronts on limestone and dolomite bluffs" by John M. Kellberg
"Twenty-eight years experience with cavernous limestone in the Tennessee valley" by Berlin C. Moneymaker
"Geologic exploration and foundation treatment for Barkley Lock" by Bruce E. Clark
"Geology and foundation treatment - the Grand Rapids project, Manitoba" by Thomas F. Thompson
"Influence of the Tampa limestone on design of the Tampa expressway" by Carl W. A. Supp
"Engineering properties of indurated clays" by Harry F. Ferguson

Engineering Geology in Glacial Terrain (afternoon)

"Glacial engineering properties involving basal till" by Arthur B. Cleaves
"Some seismic and physical properties of high-speed till in Massachusetts" by Curtis R. Tuttle
"Damsites in glacial terrain - Catskill region, New York" by Thomas W. Fluhr

Note.—No. 1961-36 is Part 2 of the copyrighted Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineers, Vol. 87, No. SM 5, October, 1961.
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"Location of acquifers in glacial terrain" by Paul H. Bird
"Engineering seismic applications in weathered rock areas" by Vincent J. Murphy

Officers for the Division on Engineering Geology include one ASCE member for 1961:

Chairman, George A. Kiersch (F. ASCE) Professor, Cornell University
Vice-Chairman, Paul H. Bird Senior Geologist, New York Public Works Department
Secretary, Robert A. Laurence, U. S. Geological Survey, Knoxville, Tennessee
Councilor, H. Garland Hershey, Director, Iowa Geological Survey
Past-Chairman, Stafford C. Happ, Atomic Energy Commission

The Division members for 1961 on the Joint ASCE-GSA Committee on Engineering Geology are:

Thomas W. Fluhr (F. ASCE) New York Board of Water Supply
Shailer S. Philbrick, U. S. Corps of Engineers, Pittsburgh, Pennsylvania

The Committee will meet this year with the ASCE members during the annual ASCE meeting in New York in October.

RESEARCH IN CIVIL ENGINEERING

The Engineering Mechanics Division is devoting one of its sessions at the Annual Meeting in New York City on the general subject of research in Civil Engineering. They believe the session will be of interest to the entire Society and welcome the support of other divisions in this effort.

PROGRAM FOR SESSION ON RESEARCH

Thursday (2:15 P.M.) October 19, 1961

New York City

THEME: RESEARCH IN CIVIL ENGINEERING

Chairman: Robert J. Hansen, Professor of Structural Engineering Massachusetts Institute of Technology

EDWARD WENK, JR., Executive Secretary, Federal Council on Science and Technology
"Relationship of Research and Civil Engineering to National Goals."

GORDON S. BROWN, Dean, School of Engineering
Massachusetts Institute of Technology
Member Committee on Engineers Joint Council on National Goals for Engineering
"The Impact of Research on Engineering."

ELMER K. TIMBY, Partner, Howard, Needles, Tammen and Bergendoff
Director, American Society of Civil Engineers
"The Role of A.S.C.E. in Supporting Research."

NATHAN M. NEWHARK, Head, Department of Civil Engineering
University of Illinois
Member, Research Committee, A.S.C.E.
"Plans of the Research Committee, A.S.C.E."

NEWS FROM ILLINOIS SECTION

The Soil Mechanics and Foundations Division of the Illinois Section, ASCE's April meeting featured Mr. Robert E. Frost, Corps of Engineers who discussed "Soil Problems in the Arctic." Having been retained as a consultant for work on the DEW line, Mr. Frost's firsthand knowledge of the area and the subject provided the basis for a very interesting and informative talk.

Mr. William H. Bussey, Harza Engineering Company, discussed "Construction Problems on Soft Foundations" at the Group's April meeting. His discussion of drydock construction in Panama was of interest to all.

The Group's May meeting featured four graduate students from our two local universities -- Northwestern and Illinois Institute of Technology. Mr. William Perloff, Northwestern, discussed "A Study of the Time Dependency of Shear Strength of Clay;" Mr. Bruce Schimming, Northwestern, discussed "A Mathematical Approach to Soil Penetrometers;" Mr. Keith McKee, I.I.T., discussed "Behavior of Footings Subjected to Dynamic Load;" and Saul Schenkman, I.I.T., discussed "Relative Density of Cohesionless Soil." After these students finished their presentation, their professors, Dr. Eben Vey, I.I.T. and Dr. J. O. Osterberg, N.U., discussed other research which is being conducted at their respective schools.

Vibroflotation was featured at the June meeting when Mr. George O. N. Reed outlined this procedure whereby cohesionless soils are compacted to carry structures which otherwise would require deep, expensive foundations.

EXECUTIVE COMMITTEE MEETING IN DENVER

The Executive Committee of the Soil Mechanics and Foundations Division met at the Brown Palace Hotel in Denver, Colorado on Sunday, June 11, 1961. One of the highlights of this meeting was the action taken to set up a Division conference to be held in 1963. This conference would be modeled along the same lines as the highly-successful Shear Conference held at Boulder, Colorado in June 1960. The theme established for the 1963 Conference was "Design and Construction Practice for Foundations on Compressible Soils." Dr. P. C. Rutledge, of the firm of Moran, Procter, Mueser & Rutledge of New York City, was selected as Chairman of the organizing committee for the 1963 Conference and his tentative acceptance of the appointment has been received. Future statements regarding the organization of the conference and of the task committee which will be involved in making the plans will probably be issued by Dr. Rutledge. The exact date and location of the proposed conference have not as yet been determined.

SOIL AND FOUNDATION ENGINEERING IN THE USSR

From September 14 to October 5, 1959, an American delegation of soil and foundation engineers visited the USSR under the sponsorship of ASCE and the Highway Research Board. The purpose of the trip was to study Soviet

research, design, construction and education in the field of soil and foundation engineering.

The American delegation consisted of the following members:

Miles S. Kersten, Professor of Civil Engineering, University of Minnesota, Minneapolis. Chairman of the delegation.

Gerald A. Leonards, Professor of Soil Mechanics, Purdue University, Lafayette, Indiana. Secretary of the delegation.

T. William Lambe, Professor of Soil Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts.

John Lowe, III, Associate Partner, Tippetts-Abbett-McCarthy-Stratton New York.

H. Bolton Seed, Associate Professor of Civil Engineering, University of California, Berkeley.

Bregory P. Tschebotarioff, Professor of Civil Engineering, Princeton University, Princeton, New Jersey.

Willard J. Turnbull, Chief, Soil Mechanics Division, U. S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

Although the length of stay was only 21 days, a large amount of information on Soviet developments in the field of soil and foundation engineering was gathered by the seven members of the delegation. Direct observations were limited to areas around Moscow, Leningrad, Kiev and Stalingrad. However, through reports given by Soviet engineers, and through personal contacts with research workers from other areas, it is believed that a coherent picture was obtained of developments in the Soviet Union. Because of the pressure of time during the visit, some errors of fact or interpretation may unknowingly have been included in the delegation's report.

The help of the Highway Research Board in administering the arrangements for the visit and the financial assistance provided by the National Science Foundation are gratefully acknowledged by the delegation.

The report has been published by the Highway Research Board as SPECIAL REPORT 60, "Soil and Foundation Engineering in the USSR," and encompasses the following.

I Introduction
- Development of USA-USSR Exchange
- Itinerary for the Delegation
- Seminars

II Observations and Impressions
- General
- Status of Soil Engineering in USSR
- Education and Research
- Summary

III Academies, Research and Design Institutes
- Institute of Foundation Engineering Research, Academy of Construction and Architecture, Moscow
- Institute of Foundation Design, Academy of Construction and Architecture, Moscow
- Research Institute of Frost Studies, USSR Academy of Sciences, Moscow
- City Trust of Geological Engineering and Mapping, Moscow
- Ukrainian Academy of Construction and Architecture, Kiev
- Local Branch, Academy of Construction and Architecture, Leningrad

IV Universities and Engineering Institutes
General
Moscow University
Moscow Civil Engineering Institute
Kiev Polytechnic Institute
Kiev Civil Engineering Institute
Leningrad Polytechnic Institute

V Construction Jobs
Highway Construction
Stalingrad Hydroelectric Station
Volga-Don Canal
Driving of Bearing and Sheet Piles and Caisson Shells
Apartment Building Construction

VI Papers by Soviet Soil Scientists and Engineers During USA Visit
Introduction
Opening Remarks - Fred Burggraf
Problems of Frozen Soil Mechanics in Engineering Practice - N. A. Tsytovich
Equipment for Field Geotechnical Investigations of Soils - I. M. Litvinov
Use of the Vibratory Method for Sinking Piles and Pile Shells in Bridge Construction in the USSR - Mikhail M. Levkin
On the Development of Soil Mechanics - N. A. Tsytovich
Basic Principles of Flexible Pavement Design and Construction - Vassily M. Bezruk
Stabilization of Settling and Weak Clayey Soils by Thermal Treatment - I. M. Litvinov
Foundation Analysis for Machines with Dynamic Loads - Roman A. Tokar
On the Design of Foundations by the Method of Limit State of the Soil Base - N. A. Tsytovich
Farewell Statement by Soviet Delegation Chairman - I. M. Litvinov

VII Papers by American Delegates at USSR Seminars
Introduction
Floating Caisson Foundations. Steel Piles with Attachments - John Lowe, III
Current Practices in Soil Sampling - John Lowe, III
Lateral Pressures of Soils - Gregory P. Tschebotarioff
Critical Elements of Design and Construction of Heavy-Duty Flexible Pavements - Willard J. Turnbull
Rotary Cone Penetrometer Investigations - Willard J. Turnbull, et al
Resumes of Papers Previously Presented in the United States by Miles S. Kersten, T. William Lambe, Gerald A. Leonards and H. Bolton Seed

Appendix
Lists of Available Russian Language Publications
To obtain the report write to:

Highway Research Board
2101 Constitution Avenue
Washington 25, D. C.

FUNDAMENTAL RESEARCH IN THE BEHAVIOR OF SOILS

The American Society of Civil Engineers, Bureau of Reclamation, and Colorado State University were co-sponsors of the Symposium on Research in Civil Engineering Fields related to Water Resources, which was held at the University in Fort Collins, Colorado, June 12-15, 1961. One of the seven panels was concerned with "Fundamental Research in the Static and Dynamic Behavior of Soils." This panel consisted of R. E. Fadum, Chairman; E.C.W.A. Geuze, W. G. Holtz, T. M. Leps, F. E. Richart, Jr., H. B. Seed, S. D. Wilson, and J. W. Hilf, Recorder.

The panel recognized that there was an urgent need for knowledge of the behavior of soils as related to water resources beyond the limit of what we now know. They pinpointed the most urgent of these research needs in the fields of soil properties, dynamic behavior of soils, field and laboratory measurements, hydraulics of soils, soil mechanics problems in design, and improvement of soil properties. The panel concluded that the implementation of research to satisfy the needs can be done only in a climate wherein the researcher will flourish. This climate is one in which freedom and continuity, proper organization, and coordination of effort exist.

It was the consensus of the panel that all who are engaged in the pursuits of Civil Engineering have a vital stake in the advancement of knowledge in this field, hence, they have responsibilities for contributing to this effort. Some of the ways in which practicing engineers, Government, the university, the professional society, and the contractor, and materials and equipment manufacturer can contribute to the research were explored.

Among the recommendations of the panel were that close collaboration be maintained with research workers in disciplines allied to Civil Engineering; that the traditional role of the practicing Civil Engineer should be extended to include responsibility for planning, gathering, and evaluating field measurements of performance; and that this additional function be established as accepted practice.

FOUNDATION FAILURES

The following is a review of a book on foundation failures, by Dr. C. Szechy of the University of Civil Engineering and Architecture, Budapest, Hungary, (Concrete Publications Ltd., London, England, 1961, 146 pp. 122 figs.) which was prepared by Dr. Jacob Feld.

Translated from the Hungarian, Dr. Szechy's lectures on foundation failures is an unusual book in its frank open description of how, why and when structures are abandoned or require extensive and expensive reconstruction because of foundation deficiencies. Of the 72 examples described some two-thirds are of Hungarian structures, and all are very well documented with sub-soil profiles, settlement readings over extended periods and careful analysis of the cause of failure. Most of the foreign (to the author) examples are taken from the literature and here the author is not as accurate. The material taken from one of the writer's papers, Example 22.23, is considerably distorted from the facts as published in the U.S.A. reference. However, the lesson is well illustrated, even if the state of conditions as described did not occur.

Dr. Szechy catalogs foundation failures under the general causes of:

I. Inadequate investigation of the site. (eight examples to describe six types of trouble resulting.).

II. Unsuitable types of Structures and Foundations (25 examples describe fourteen different design errors.).

III. Defects and Failures Due to Defective Execution (22 examples describe 19 different types of omission.).

IV. Failures Due to External Influences. (17 examples of 16 forms of natural and artificial modification of the sub-soil after a successful construction operation).

The American reader will disagree with the classification in Part III, unless he realizes that in European construction technique, the contractor's execution includes many phases which we call design and which we therefore could include in Part II.

Some of the types of failures described could be further enriched by information in the technical literature of the U.S.A., Great Britain and Canada, from which the author only cited five, three and two respectively. On the other hand, most of the failures described have never previously been available in the English literature.

The text is illustrated by 102 diagrams and 20 figures, very clearly presented and giving valuable information in addition to the descriptions.

The writer clearly states the value to be obtained by a complete description of the nature and cause of all structural failures and pleads that other engineers will follow his example in presenting such data for the benefit of the entire profession. With this, the writer is in full accord and personally thanks Dr. Szechy for the contribution in this work.

NEW GYRATORY TESTING MACHINE

The new gyratory tester (Fig. 1) is a combination compaction and testing machine for use on base course materials, soils and bituminous mixtures.

The machine produces test specimens by a kneading compaction process. Extensive experiments by the U.S. Corps of Engineers have demonstrated that specimens prepared by the kneading compaction process have stress-strain properties that closely represent those of actual compacted soils or bituminous pavements. Therefore, it has been found that specimens prepared by this process are more reliable for use in laboratory strength and consolidation tests.

The Gyratory Tester directly indicates the phenomenon of excess plasticity. Excess plasticity occurs in granular plastic materials, such as soils or bituminous paving mixtures, when the voids become overfilled due to excessive bitumen in pavement. This phenomenon is indicated by an increase in the width of the gyrograph, a recording of the gyratory motion of the machine. This chart makes it possible to predict the maximum permissable bitumen content for pavement mix when the ultimate expected density is known or can be estimated.

It is possible to test cores from an existing pavement to determine whether the pavement may fail at a future time due to over plasticity caused by densification under traffic compaction. Estimates of how much traffic can be carried before this over-plasticity will occur can also be made.

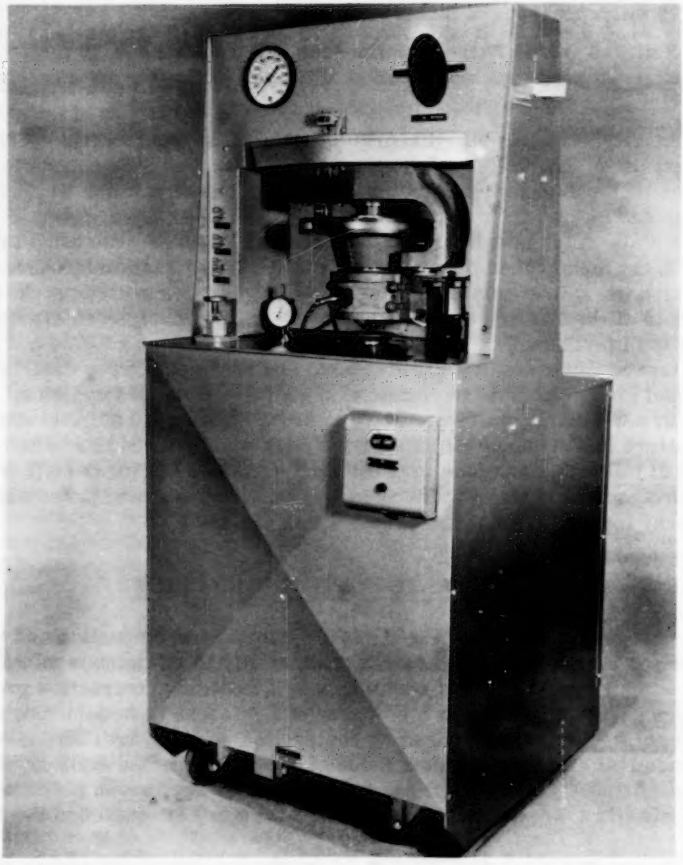

FIG. 1.— NEW GYRATORY TESTING MACHINE

The testing machine may be used as a dynamic consolidation or repetitive loading device for soils, base courses and bituminous pavements. Vertical pressures of the magnitude expected in the actual pavement structure can be

applied and the slight kneading action introduced by the gyrating mechanism. This load and movement simulates the effects of traffic.

The machine may be used to study abrasion resistance of aggregate by measuring degree of breakdown under various loading by screen analysis before and after testing.

INFORMATION - EARTH PRESSURE CELLS

Carl B. Crawford and the National Research Council of Canada have recently prepared a summary of information on "Earth Pressure Cells - Design, Calibration and Performance."

Since this subject is of current interest, copies are available from the Division of Building Research, National Research Council, Ottawa 2, Canada.

NEW ASCE TRANSACTIONS SOON TO GO TO PRESS

In mid-May all Society members received a brochure describing the revamping that the TRANSACTIONS are undergoing. Since that time thousands of orders have been received, but still more should have reached us.

Beginning with Volume 126 (1961), TRANSACTIONS will be issued as a standard set of five parts, containing all Division Journal papers, according to the following schedule:

Part I	Engineering Mechanics, Hydraulics, Soil Mechanics and Foundations
Part II	Construction, Structural
Part III	Irrigation and Drainage, Power, Sanitary Engineering
Part IV	Air Transport, City Planning, Highway, Pipeline, Surveying and Mapping, Waterways and Harbors
Part V	Professional Practice

Members of ASCE can enter standing orders to any one, or more, of Parts I through IV at $3.50 each per year; the price for Part V will be $2.00 per year. Members can effect a considerable saving by subscribing to all five parts—the total price of $16.00 is reduced to $10.00.

Part V is reserved for the papers published in the Journal of Professional Practice, which is of interest to all members, regardless of their technical specialties. Part V will also contain the President's Annual Address, abstracts of the memoirs of deceased members, Final Reports of Committees in the Department of Conditions of Practice, and combined subject and author indexes for Parts I through V.

A single binding has been selected, more attractive and durable than the paper, cloth, and morocco-grained covers used in the past. This binding will be in the Society's official Royal Blue, composed of cloth impregnated with vinyl. The spine will contain horizontal rules to match those used previously on the morocco-grained volumes. The binding and gold stamping will resist fading and will not deteriorate in warm, moist climates.

The TRANSACTIONS will be mailed in December of each year and the bills will be sent out at that time.

Please use the coupon below to place your order. Do not send in a coupon if you previously mailed the original order card.

---------- CUT HERE ----------

Please enter my standing order for the New ASCE TRANSACTIONS (beginning with Vol. 126, 1961) as follows (Do not prepay):

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TO ASCE MEMBERS OF CHI EPSILON

Chi Epsilon Fraternity, national civil engineering honor society, has officially offered to supply the funds necessary to furnish a formal Conference Room at the United Engineering Center. This room will be on the ASCE executive floor, will be named "The Chi Epsilon Room," and will be available for conference and committee meetings.

Pledges are not expected, but single voluntary gifts, from members and friends of the Fraternity are earnestly solicited. An attractive Commemoration Book has been planned in which donors of $100 or more (singly or in groups) may inscribe the name of a revered person.

On request, the national chairman, Samuel Kramer (8701 Shore Road, Brooklyn 9, New York) will be glad to mail a descriptive brochure. Your gift is tax deductible if you make your check out to "ASCE CHI EPSILON ROOM FUND" and mail it to Mr. Donald D. King, ASCE, 345 East 47th Street, New York 17, N. Y. Your gift will be automatically credited to the quota of your initiating Chapter. The national goal is $10,000; as of September 8, $7,100 has been collected.

RESEARCH CONFERENCE ON SHEAR STRENGTH OF COHESIVE SOILS

The papers presented at the ASCE Research Conference on Shear Strength of Cohesive Soils held at the University of Colorado, in June 1960, have been published in a single hardbound volume. The book contains the Foreword, Conference Program, Photographic Report, Opening Address, and all 26 Conference Papers. Also included are the written discussions and closures, and the reports by the moderators of panel sessions. The book has been prepared in an attractive cloth binding and is complete with a Table of Contents - Subject Index and Index of Authors and Discussers.

The list price for this volume is $10.00 per copy (net); no discounts are available.

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American Society of Civil Engineers
United Engineering Center
345 East 47th Street
New York 17, New York

Please send____copy(s) of the Research Conference on Shear Strength of Cohesive Soils.

The amount enclosed is $_____.

Name_____
(Please Print)

Address_____

City_____Zone____State_____

...S.S.

DECEMBER NEWSLETTER

Deadline date for arrival at this office of contributions for the December Newsletter: October 27, Please.

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